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13 Pages

TCS-80246/65

February 1965

PHOTOGRAPHIC INTERPRETATION REPORT

**PROBABLE SOLID PROPELLANTS
TEST FACILITY AND ASSOCIATED
PRODUCTION FACILITIES
BIYSK, USSR**



CIA



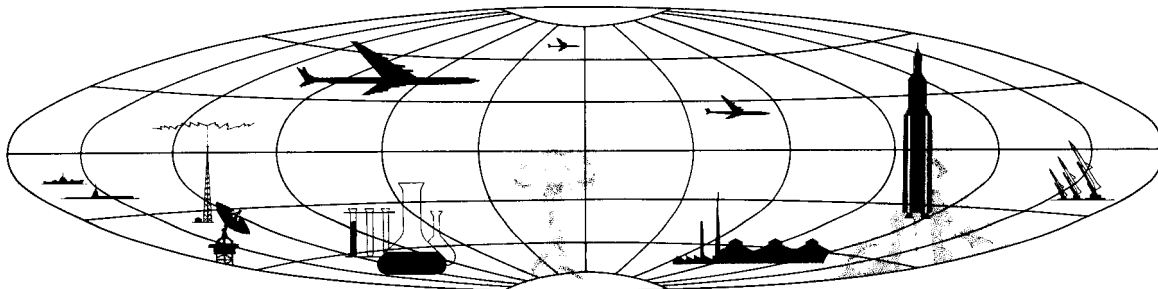
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PHOTOGRAPHIC INTERPRETATION REPORT

**PROBABLE SOLID PROPELLANTS
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SUMMARY

The Biysk Probable Solid Propellants Test Facility, a component of the Biysk Explosives Plant in the USSR, was first seen in an early stage of construction on photography of [REDACTED]

[REDACTED] it appeared complete and ready to go into operation. The Suspect Solid Propellants Production Area, also a component of the Explosives Plant, has undergone construction during the same period and also appeared complete by [REDACTED]

The Biysk test facility appears to be the most elaborate of 5 such facilities in the USSR which were all developed during the [REDACTED] period. The others are at Kamensk-Shakhtinskiy, Krasnoyarsk, Perm, and Sterlitamak. These 5 facilities have a number of features in common. All are associated with double-base explosives manufacturing plants; all contain 1 or 2 test cells with their associated blast deflectors; each has a large assembly and

checkout building; all contain a number of support buildings of similar appearance. In addition, groups of offset temperature-conditioning buildings have been observed near all 5 installations, and possible casting facilities have been observed in all 5 of the adjacent explosives plants.

Double-base solid propellants have probably been manufactured and cast in the Biysk Explosives Plant in the past for use in small rockets, and the earliest large rocket motors may have been produced here. The Suspect Rocket Propellants Production Area is probably designed to turn out more complex and advanced propellants than can be produced by the old double-base process in the older facilities of the explosives plant.

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INTRODUCTION

The purpose of this report is to describe the Biysk Probable Solid Propellants Test Facility and associated production facilities.

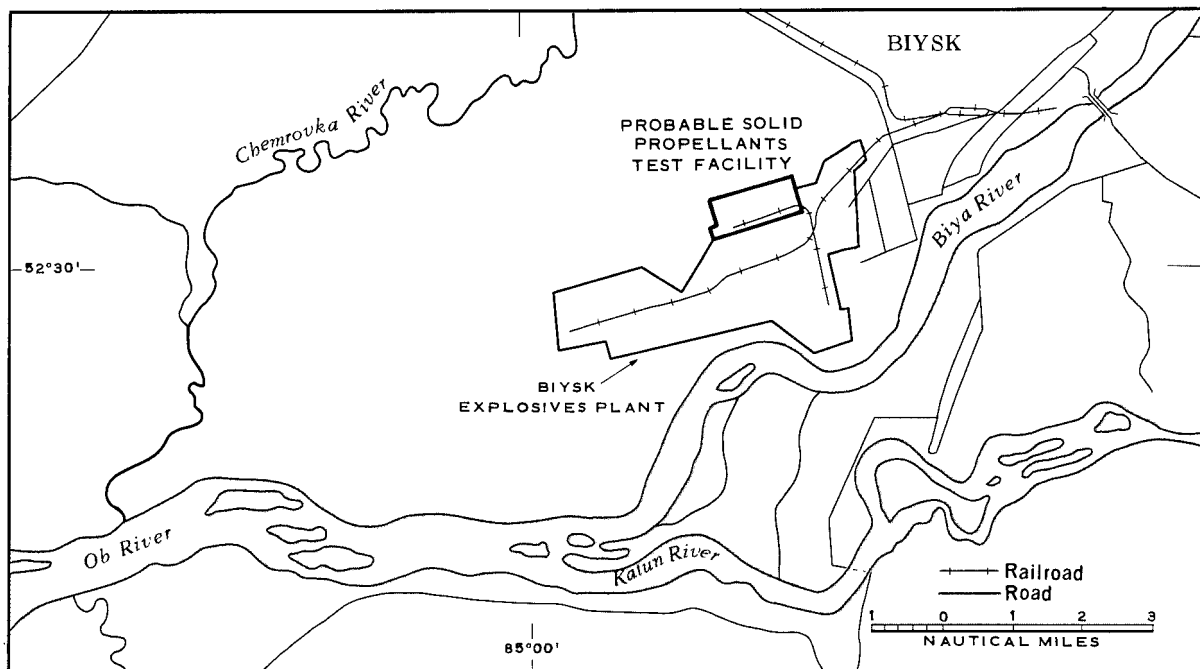


FIGURE 1. LOCATION MAP.

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The test facility is located at 52-31N 85-05E, approximately 5 nautical miles (nm) west-southwest of a highway bridge crossing the Biya River in the city of Biysk, USSR (Figure 1). This test facility is in the northeastern sector of a large manufacturing complex (Figure 2) which occupies an area measuring about 5 by 1 nm and consists principally of the Biysk Explosives Plant [] and a small test position situated about 8,775 feet west-northwest of the test facility. The Suspect Solid Propellants Production Area constitutes part of the explosives manufacturing complex and is located in the southeast sector. Other installations in the complex, most of which are probably associated with the explosives plant, are an explosives storage area, a probable administration and engineering research and development area, a large unidentified building which has some of the characteristics of an aircraft assembly building, a personnel and service area, a large industrial area which is designated for reporting purposes as Related Industrial Activity, and a mechanical extraction operation. Detailed discussion in this report is confined to those facilities which may be involved in the production and testing of solid propellants.

PROBABLE SOLID PROPELLANTS TEST FACILITY

When first observed in [] this test facility (Figures 2, 3 and 4) was in an early stage of construction. It was not identified as a test facility, however, until coverage of [] when it occupied a double-fenced area measuring approximately 2,800 by 2,700 feet. 1/ By [] new construction to the east increased the overall size to approximately 7,000 by 2,700 feet. The original western portion which contains the 2 test cells is still surrounded by a double fence, and the

inner fence is of solid construction. The eastern portion of the facility is secured by a single fence, at least part of which is a wall. A rail spur serves the facility, and additional rail spurs appear to be under construction (Figure 4).

The double-fenced western portion of the test facility contains the following items: 2 test cells (items 1 and 2, Figure 4) and their associated blast deflectors, a large rail-served H-shaped assembly and checkout building (item 4), a tall, rail-served rectangular building (item 6), 7 other buildings of varying size, and a shell-testing range. The eastern portion contains 2 groups of 3 offset temperature-conditioning buildings (items 13 and 14), 2 groups of 5 offset buildings (items 10 and 12), 1 large irregularly shaped building (item 11), and 2 rectangular buildings. The offset temperature-conditioning buildings are probably rail served (or will be) and are served by a steamline which also serves the test cells. A small secured area containing 3 buildings is situated immediately south of the facility. A small storage area which is, or probably will be, rail served is immediately west of the southwest corner of the test facility. A perspective view of the test facility is presented on Figure 5.

About 8,775 feet to the west-northwest of the Probable Solid Propellants Test Facility is a small activity that was believed to be an explosives burn area when first observed in the early stages of construction on photography of [] Better photography of [] and [] permitted identification of this facility as a test position, the significant feature being a U-shaped revetment that faces a natural embankment which serves as a blast deflector. A small building at the position was first seen in []. The typical test cell is absent, but facilities for horizontal testing are apparently present.

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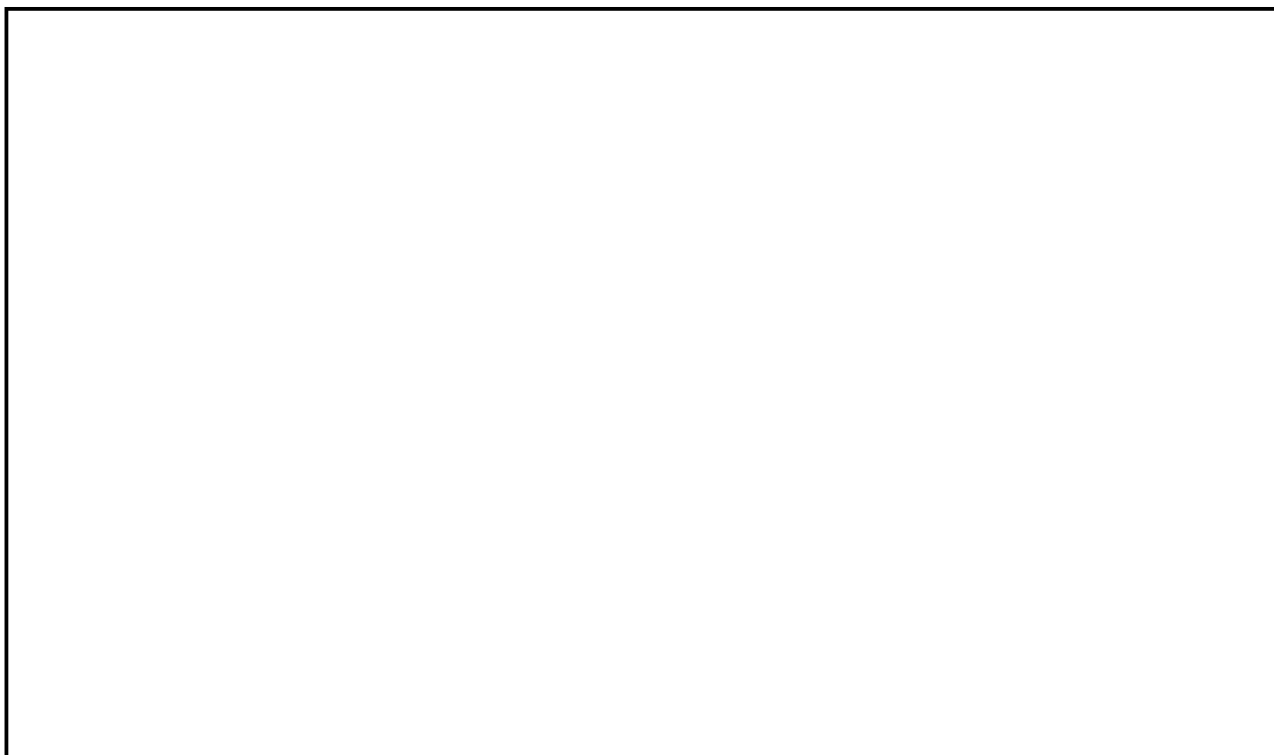
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The Probable Solid Propellants Test Facility was first seen on poor-quality photography of [redacted] at which time it was in an early stage of development. By [redacted] the H-shaped assembly and checkout building was under construction, and work had probably started on the 2 test cells. The first clear photography, that of [redacted] permitted identification of 1 test cell (item 2, Figure 4), showed that the other test cell was still under construction, and revealed that the H-shaped building had been completed. Photography of [redacted] was of poor quality, and no changes were discernible. However, [redacted] was excellent and showed that the second test cell (item 1) had been completed, that 2 large and 2 small support buildings had been constructed, and that 2 possible tanks were located just west of the facility (Storage, Figure 4).

The only usable photography obtained in [redacted] This photography revealed that a group of 3 offset temperature-conditioning buildings (the first 3 units of item 12) had been constructed 4,200 feet east of the double-fenced portion of the test facility, and 1 of the 2 rectangular buildings had been constructed in the same vicinity. Photography of [redacted] revealed 2 new groups of offset buildings east of the test facility. [redacted] revealed no apparent change, but the good coverage of [redacted] permitted significant new interpretations. The number of offset buildings had increased to a total of 16 arranged in 2 groups of 5 and 2 groups of 3 buildings. Steamlines identified on this photography serve the 2 main test cells and the offset buildings. The second rectangular building and the irregularly shaped building (item 11) had been constructed, and fencing of the eastern part of

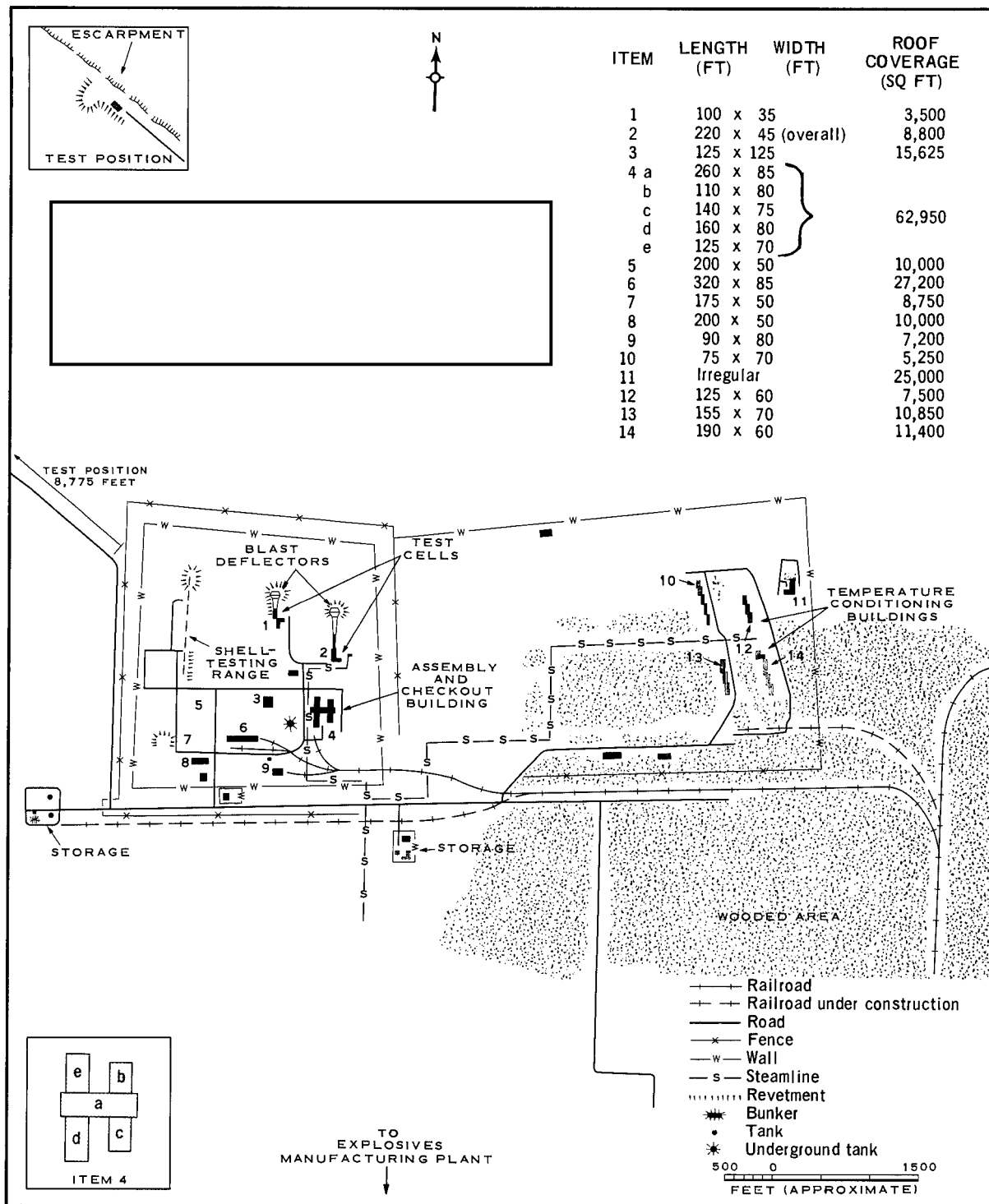
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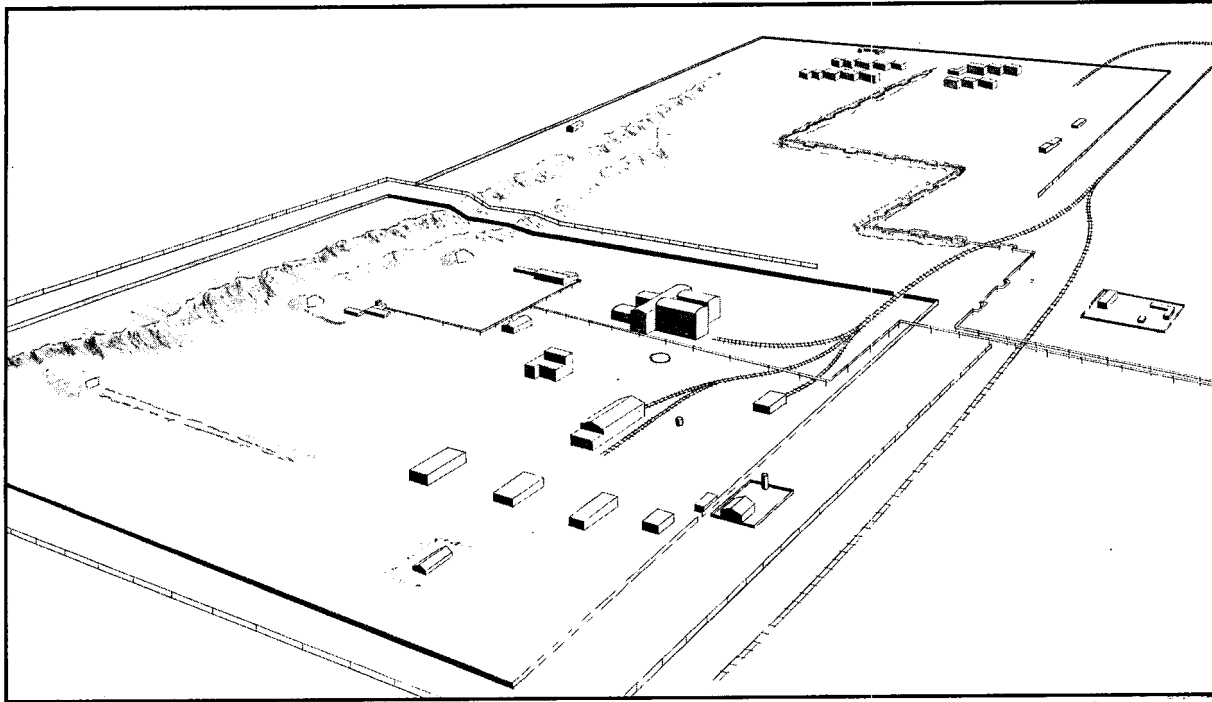
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FIGURE 5. PERSPECTIVE VIEW OF THE BIYSK PROBABLE SOLID PROPELLANTS TEST FACILITY.

the test facility was complete, or nearly so. The [redacted] photography also permitted identification of the shell-testing range, previously thought to be a third test cell under construction. At this time with the exception of 2 rail spurs which were possibly still under construction, the facility appeared to be complete and ready to go into operation.

The Biysk Probable Solid Propellants Test Facility appears to be the most elaborate of the 5 such facilities that have so far been identified in the USSR, the others being at Kamensk-Shakhtinskiy, Krasnoyarsk, Perm, and Sterlitamak; 2-5/ however, all 5 facilities have a number of features in common. They all contain at least 1 test cell with an associated concrete-faced blast deflector; Biysk and Krasnoyarsk each have 2 such test cells. An H-shaped assembly and checkout building, which may house handling facilities for solid fuel rockets and associated test equipment, has been

identified in the immediate vicinity of the test cell(s) at Biysk, Krasnoyarsk, and Sterlitamak. Perm has a modified H-shaped building, and Kamensk-Shakhtinskiy has a large high-bay building which may serve the same purpose. Groups of offset temperature-conditioning buildings have been observed at all 5 test facilities, either in the test areas or in the associated suspect solid propellants production areas. Perm and Kamensk-Shakhtinskiy have 1 group of offset buildings each, Sterlitamak and Krasnoyarsk have 2 groups each, and Biysk has 5 (4 in the test area and 1 in the Suspect Solid Propellants Production Area). These offset buildings are believed to be temperature-conditioning facilities for solid propellant rocket motors, bringing them to the proper temperature before testing. Sterlitamak and Biysk each have a shell-testing range in their areas, and the Kamensk-Shakhtinskiy facility has 2 such ranges. All 5 test facilities contain a number

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of support buildings of a similar variety. Finally, all of the test facilities are associated with double-base explosives plants that have added suspect solid propellants production facilities during about the same period that the test facilities were constructed.

BIYSK EXPLOSIVES PLANT

The Biysk Explosives Plant is an industrial complex (Figure 2) consisting of a number of separate but interrelated areas. The Suspect Solid Propellants Production Area is of primary interest in this report. Other parts of the complex which will be discussed briefly are designated the Original Explosives Plant, the Suspect Industrial Explosives Plant, the Steam/Powerplant, the New Explosives Plant, and the Explosives Storage Area.

ORIGINAL EXPLOSIVES PLANT

This plant at the eastern end of the manufacturing complex (Figure 2) was probably in production when first seen on photography of [REDACTED]. As compared with other areas in the complex, this plant has undergone the least amount of growth through [REDACTED]. The most significant new construction in this area is a possible casting facility, first seen on photography of [REDACTED] which will be described in connection with the Suspect Solid Propellants Production Area. Otherwise the plant consists of a probable nitrocellulose area, a probable nitroglycerine area, a mixing and blending area, and a drying/curing/ storage area. These facilities are all needed for the production of standard double-base propellants. It appears, therefore, that it manufactures military explosives such as initiators, bursting charges, and small rocket propellants.

STEAM/POWERPLANT

The steamplant, which was in operation when the Biysk Explosives Plant was first seen in [REDACTED] is situated immediately west of the Original Explosives Plant (Figure 2). Since first seen, this plant has been enlarged and now has the capability to produce electric power as well as steam.

SUSPECT INDUSTRIAL EXPLOSIVES PLANT

This explosives manufacturing area in the western part of the complex (Figure 2) also was in existence at the time of first photographic coverage in [REDACTED]. It was probably in production at that time and has since shown considerable growth in its easternmost part. This plant is suspect as a producer of industrial explosives.

NEW EXPLOSIVES PLANT

This plant, which is immediately south of the Suspect Industrial Explosives Plant (Figure 2), is apparently a comparatively new development. Construction in the Possible Cellulose Area was first observed in [REDACTED] and progress in construction could be observed on photography of [REDACTED]. [REDACTED] the Possible Cellulose Area was either complete or nearing completion. The adjoining Possible Nitrating Area was present in [REDACTED] but storage facilities have been added since then.

EXPLOSIVES STORAGE AREA

In [REDACTED] there were 6 revetted buildings in this rail-served storage area for explosives. The number of buildings increased to 26 by [REDACTED] and to 29 by [REDACTED]. Photography of [REDACTED] shows no additional increase in the number of buildings.

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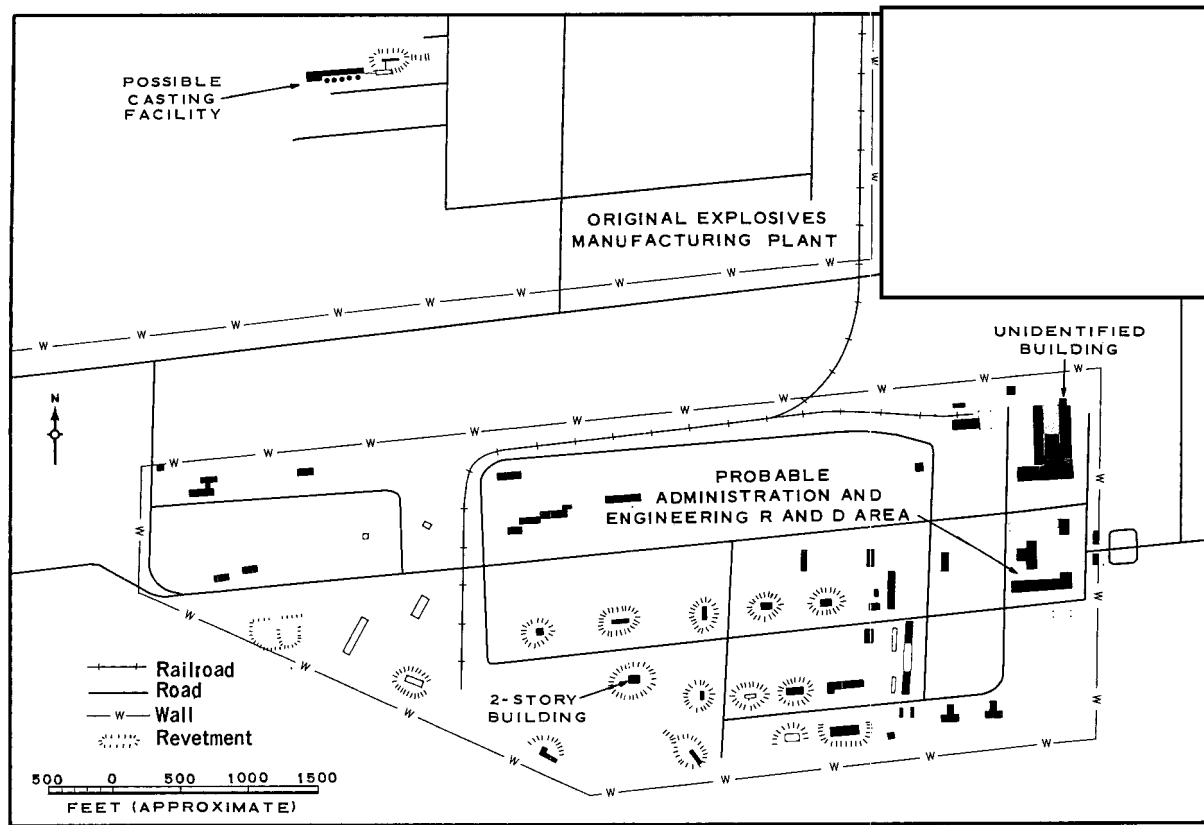


FIGURE 6. LAYOUT OF THE SUSPECT SOLID PROPELLANTS PRODUCTION AREA.

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SUSPECT SOLID PROPELLANTS PRODUCTION AREA

This area is situated immediately south of the Original Explosives Plant (Figure 2) and is separately secured by a wall or solid fence which also encloses a large unidentified building and the Probable Administration and Engineering R & D Area. A definite function cannot be assigned to this area; however, certain interpretations can be made based on its period of development and on a comparison of the facilities within the area with those in typical explosives manufacturing areas.

When first seen in [redacted] the heavily revetted buildings were present but the operational status of the area was questionable. In [redacted] the status was still undetermined and new buildings ap-

peared in the area. By [redacted] several new buildings had been added, but little change had been made in the revetted buildings. Good-quality photographic coverage of [redacted] revealed that this area was engaged in the manufacture of a new or modern product that requires facilities not exactly similar to those seen in other areas of the explosives complex. This product could be a series of new explosives or specialized propellants for rocket motors. The existence of a group of 3 offset buildings in the plant and the proximity of the possibly casting facility to this area indicates a probable capability to mix or blend, cast, and cure propellants.

One unusual feature of this area is a revetted 2-story building (Figure 6) that is the largest

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revetted structure in the complex. The second story is smaller in size than the first and projects above the revetment. The presence of this building is suggestive of a continuous flow operation on a large scale.

Of particular significance, in connection with the suspect function of this area, was the construction of a possible casting facility in the adjacent Original Explosives Plant (Figure 6). This possible casting facility was first observed on photography of [REDACTED]

[REDACTED] and it is very similar to facilities observed at Kamensk-Shakhtinskiy, Sterlitamak, Perm, and Krasnoyarsk where solid propellants production is also suspect. 2-5/ This facility consists of a long irregularly shaped structure flanked by 5 or more connected cylindrical structures, silolike in appearance, which may be chambers for casting large solid propellant rocket motors. The diameters of the cylindrical structures vary from approximately 30 to 40 feet. At the eastern end of the possible casting facility in the Biysk plant is a large oval revetment containing either a very large horizontal tank or a long, low, narrow building which may serve as a curing oven. A perspective drawing of a possible casting facility as observed at Biysk and the other four installations is presented on Figure 7.

The chronological development of the Probable Solid Propellants Test Facility at Biysk, including the appearance of the offset temperature-conditioning buildings and the possible casting facility, corresponds roughly to the chronological development of the Suspect Solid Propellants Production Area. As mentioned earlier in this report, a similar chronological development of the corresponding facilities has been observed at the other 4 installations in the USSR previously mentioned in this report.

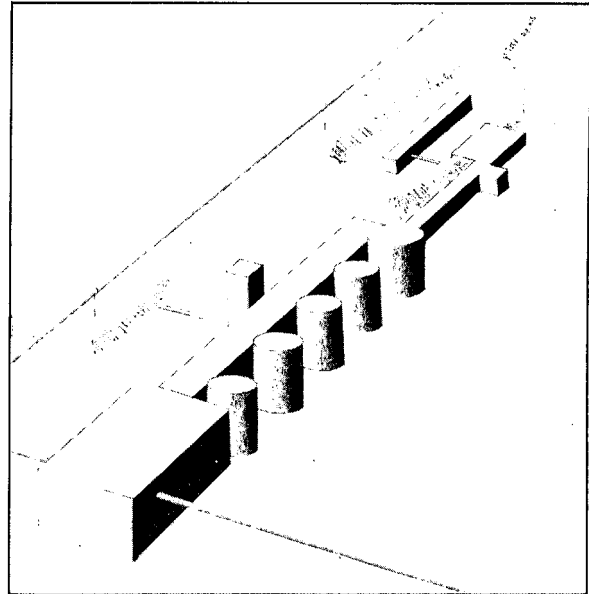


FIGURE 7. PERSPECTIVE VIEW OF A POSSIBLE CASTING FACILITY.

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OTHER ASSOCIATED ACTIVITIES

Other activities associated with the Biysk Explosives Plant but which are probably related only indirectly or not at all to solid propellants production and testing are the Probable Administration and Engineering Research and Development Area, an unidentified building, the Personnel and Service Area, the Related Industrial Activity, and the Mechanical Extraction Operation (Figure 2).

The Probable Administration and Engineering Research and Development Area is located in the eastern end of the walled area that contains the Suspect Solid Propellants Production Area (Figure 6). It consists of a group of 3 buildings arranged with 2 similar rectangular structures on either side of a T-shaped building. Construction on one of the rectangular buildings was noted in [REDACTED] As of [REDACTED] [REDACTED] the 2 rectangular buildings were complete,

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but part of the roof of the T-shaped building was not complete. This exact layout is duplicated in a new area of the Perm Explosives Complex, but the T-shaped building there was only in early stages of construction in [REDACTED]

The unidentified building is immediately north of the Administration and Engineering R & D Area and within the same walled area (Figures 2 and 6). This building was first seen under construction in [REDACTED] and appeared to be complete in [REDACTED]. It is a large building with a high-bay section adjoining a lower section with longitudinal monitors, and it resembles an aircraft assembly building.

The Personnel and Service Area to the northeast of the Original Explosives Plant contains approximately 15 buildings. The north edge of this area abuts the Related Industrial Activity (Figure 2) which consists of a probable prefabrication plant, machine shops, foundries, and wood processing and storage/supply facilities. This area has shown growth since the first coverage of December 1960. It is connected to the explosives plant by rail and road.

The Mechanical Extraction Operation (Figure 2) north of the Related Industrial Activity consists of a strip or open mining activity and buildings to process the mined product. This product could be building materials such as sand or gravel. It is connected to the explosives

complex as well as to the Related Industrial Activity by rail.

About 3 nautical miles to the southwest of the explosives plant complex is a facility that may be associated with the manufacture of explosives and propellants. At this facility, which is situated on the north bank of the Biya River, logs are pulled from the river and cut or processed. A road connects this facility with the explosives plant complex, and a railroad is under construction which will join the rail line at Biysk.

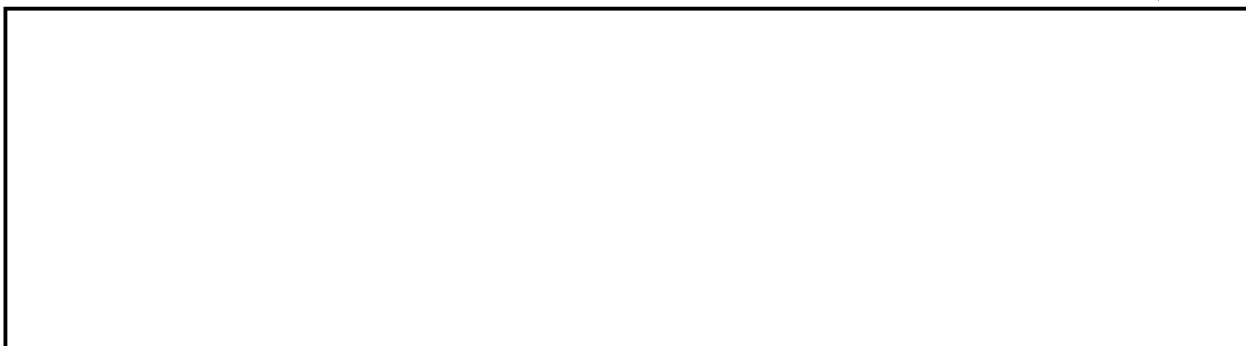
CONCLUSIONS

1. The Probable Solid Propellants Test Facility was essentially complete by [REDACTED] and was probably ready to go into operation at that time.

2. Double-base solid propellants have probably been manufactured and cast in the Original Explosives Plant for use in small rockets for ground troops, and the earliest large rocket motors may have been produced here.

3. The Suspect Solid Propellants Production Area was probably designed as a more modern plant to turn out more complex and advanced propellants than those produced by the old double-base process in the Original Explosives Plant. The new plant appeared to be complete on [REDACTED]

REFERENCES



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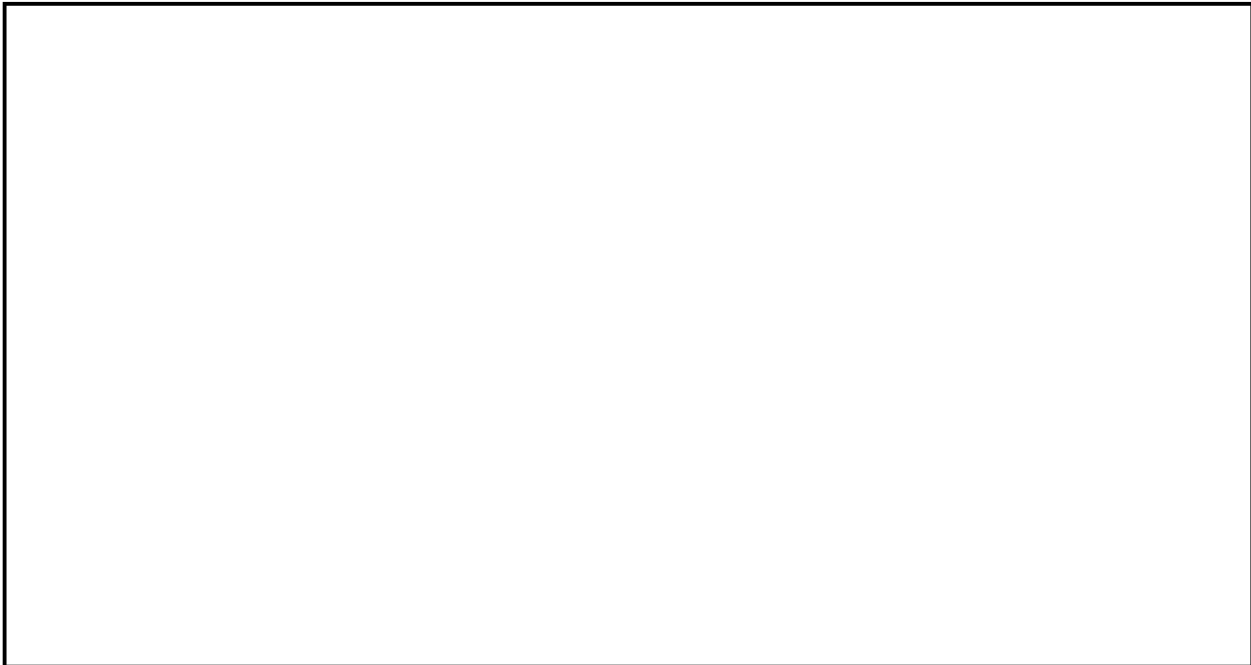
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REFERENCES (Continued)



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MAPS OR CHARTS

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REQUIREMENT

CIA. C-RR4-81,679

NPIC PROJECT

N-863/64 (partial answer)

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